

**To:** Amoroso, Cathy[Amoroso.Cathy@epa.gov]; Richards, Jon M.[Richards.Jon@epa.gov]; Adams, Glenn[Adams.Glenn@epa.gov]  
**From:** Alexander, Shanna[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=029C4B2A652C4FC0B3A09F2BE2C0F42A-MOSSALEXAND]  
**Sent:** Tue 12/21/2021 4:01:46 PM (UTC)  
**Subject:** RE: follow up on Principals meeting last week

Interesting... you would think once a rad gets detected in surface water and added to the fish tissue monitoring list that it would stay on the monitoring list especially given the nature of rads. There shouldn't be an option to drop rads 5 years later after it has already been detected in surface water or biota. My understanding is that they did monitor for Cs-137 but are only reporting positively detected rads in fish tissue including those rads that may not have been included in the last monitoring event (e.g., Am). For instance, Section 6.6.4.1 states that Am, Np, Pu and Th were additional rads added to the 2020 analysis, but the table does not list Am or Th. This is likely because they weren't detected in fish tissue, but not because they didn't analyze for it. So for Cs-137, it may be that it was detected in fish during one event and then not in the other event for a variety of reasons (age of fish sampled, low fish counts, muscle tissue content, seasonal variation, concentration fluctuations on uptake rates, etc.).

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**From:** Amoroso, Cathy <Amoroso.Cathy@epa.gov>  
**Sent:** Tuesday, December 21, 2021 10:21 AM  
**To:** Alexander, Shanna <Alexander.Shanna@epa.gov>; Richards, Jon M. <Richards.Jon@epa.gov>; Adams, Glenn <Adams.Glenn@epa.gov>  
**Subject:** RE: follow up on Principals meeting last week

Yep. And different rads are sampled in different years, so looking at ASER reports, some years Cs is included, other years, not.

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**From:** Alexander, Shanna <Alexander.Shanna@epa.gov>  
**Sent:** Tuesday, December 21, 2021 10:08 AM  
**To:** Amoroso, Cathy <Amoroso.Cathy@epa.gov>; Richards, Jon M. <Richards.Jon@epa.gov>; Adams, Glenn <Adams.Glenn@epa.gov>  
**Subject:** RE: follow up on Principals meeting last week

Thanks Cathy. This was also the basis for the background comparison table that I just shared. One concern I have with this is that they did not analyze for rads in fish carcass so we do not know if bone seeking rads like Sr-90 and Pu isotopes are elevated above the background levels in addition to Np-237.

Shanna

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**From:** Amoroso, Cathy <Amoroso.Cathy@epa.gov>  
**Sent:** Tuesday, December 21, 2021 10:03 AM  
**To:** Richards, Jon M. <Richards.Jon@epa.gov>; Adams, Glenn <Adams.Glenn@epa.gov>; Alexander, Shanna <Alexander.Shanna@epa.gov>  
**Subject:** RE: follow up on Principals meeting last week



#### 6.6.4.1. Data Collection and Analysis

Sunfish (*Lepomis macrochirus*, *L. aurochirus*, and *Ambloplites rupestris*) and catfish (*Ictalurus punctatus*) are collected from each of the three locations to represent both top-feeding and bottom-feeding-predator species. In 2020, a composite sample of each of those species at each location was analyzed for selected metals, polychlorinated biphenyls (PCBs), tritium, gross alpha, gross beta, gamma-emitting radionuclides, and total radioactive strontium. To accurately estimate exposure levels to consumers, only edible portions of the fish were submitted for analysis. Once every 5 years, additional radiological analyses are performed to confirm the dose model (see Chapter 7). In 2019, additional radionuclides detected included neptunium, plutonium, thorium, and uranium isotopes. Based on the 2019 results, some additional radionuclide

analyses were again performed in 2020, including americium, neptunium, plutonium, and thorium. Results are presented in Table 6.7.

TDEC issues advisories on consumption of certain fish species caught in specified Tennessee waters. These advisories apply to fish that could contain potentially hazardous contaminants. TDEC has issued a “do not consume” advisory for catfish in the Melton Hill Reservoir in its entirety, not just in areas that could be affected by ORR activities, because of PCB contamination. Similarly, a precautionary advisory for catfish in the Clinch River arm of Watts Bar Reservoir has been issued because of PCB contamination (TDEC 2020). TDEC also issues advisories for consumption of fish when mercury levels are over 0.3 ppm; the three locations on the Clinch River where ORR fish are collected do not have mercury “do not consume” advisories waters (Denton 2007).

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**From:** Amoroso, Cathy

**Sent:** Tuesday, December 21, 2021 9:57 AM

**To:** Richards, Jon M. <[Richards.Jon@epa.gov](mailto:Richards.Jon@epa.gov)>; Adams, Glenn <[Adams.Glenn@epa.gov](mailto:Adams.Glenn@epa.gov)>; Alexander, Shanna <[Alexander.Shanna@epa.gov](mailto:Alexander.Shanna@epa.gov)>

**Subject:** RE: follow up on Principals meeting last week

6.6.4. Fish Members of the public could be exposed to contaminants originating from DOE ORR activities through consumption of fish caught in area waters. This potential exposure pathway is monitored annually by collecting fish from three locations on the Clinch River and by analyzing edible flesh for specific contaminants. The locations are as follows (Figure 6.6): ♣ Clinch River upstream from all DOE ORR inputs (CRK 70) ♣ Clinch River downstream from ORNL (CRK 32) ♣ Clinch River downstream from all DOE ORR inputs (CRK 16)

Table 6.7. Tissue concentrations in catfish and sunfish for detected mercury, PCBs, and radionuclides, 2020<sup>a</sup>

| Metals (mg/kg)                     | CRK 16<br>Downstream |                  | CRK 32  |                   | CRK 70<br>Upstream |                    |
|------------------------------------|----------------------|------------------|---------|-------------------|--------------------|--------------------|
|                                    |                      |                  | Species |                   |                    |                    |
|                                    | Catfish              | Sunfish          | Catfish | Sunfish           | Catfish            | Sunfish            |
| Hg                                 | 0.049                | 0.12             | 0.053   | 0.041             | 0.08               | 0.025 <sup>b</sup> |
| <b>Pesticides and PCBs (µg/kg)</b> |                      |                  |         |                   |                    |                    |
| PCB-1260                           | 170                  | 110 <sup>b</sup> | 140     | 17.3 <sup>b</sup> | 33                 | 113 <sup>b</sup>   |
| <b>Radionuclides (pCi/g)</b>       |                      |                  |         |                   |                    |                    |
| Alpha activity                     | c                    | 0.37             | 0.33    | 0.36              | c                  | c                  |
| Beta activity                      | 3.4                  | 4.1              | 3.1     | 4.3               | 3.7                | 3.2                |
| <sup>40</sup> K                    | 3.1                  | 4.3              | 3.1     | 3.4               | 4.4                | 3.5                |
| Tritium                            | c                    | c                | 0.21    | c                 | c                  | c                  |
| <sup>237</sup> Np                  | 0.0050               | c                | 0.018   | c                 | c                  | c                  |
| <sup>238</sup> Pu                  | c                    | c                | 0.006   | c                 | c                  | c                  |
| <sup>239/240</sup> Pu              | c                    | c                | c       | c                 | 0.011              | 0.0073             |

<sup>a</sup> Only parameters that were detected for at least one species are listed in the table.

<sup>b</sup> "J" indicates that the result is an estimated value.

<sup>c</sup> Value was less than or equal to minimum detectable activity.

**Acronyms:**

CRK = Clinch River kilometer

PCB = polychlorinated biphenyl

**From:** Richards, Jon M. <Richards.Jon@epa.gov>

**Sent:** Monday, December 20, 2021 9:54 AM

**To:** Adams, Glenn <Adams.Glenn@epa.gov>; Amoroso, Cathy <Amoroso.Cathy@epa.gov>; Alexander, Shanna <Alexander.Shanna@epa.gov>

**Subject:** RE: follow up on Principals meeting last week

6.4.2. Results In 2020, as has been the case since 2009, there were no statistical differences in radionuclide concentrations in surface water samples collected from the Clinch River upstream and downstream of DOE inputs. No radionuclides were detected above 4 percent of the respective DCSs. Mercury was not detected in 2020 in samples from any of the three sampling locations where mercury samples are collected, Clinch River kilometer (CRK) 66, CRK 32, and CRK 16.

Jon Richards

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**From:** Adams, Glenn <Adams.Glenn@epa.gov>

**Sent:** Monday, December 20, 2021 9:47 AM

**To:** Amoroso, Cathy <Amoroso.Cathy@epa.gov>; Richards, Jon M. <Richards.Jon@epa.gov>; Alexander, Shanna <Alexander.Shanna@epa.gov>

**Subject:** follow up on Principals meeting last week

<https://doeic.science.energy.gov/ASER/>

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